

consideration by the Examiner (Box 4a/Continuation Sheet, Office Action Summary, Paper No. 20070806). (Although Box 4a includes claim 125 in the list of withdrawn claims, claim 125 is included in the list of rejected claims, and appears to be rejected at page 3 of the Official Action.) Accordingly, claims 25-56, 62, 71, 80, 89, 98, 107, 116, 125, 134, 143, 152, 161, 170, 179, 188, 197 and 201-212 are currently elected, of which claims 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53 and 55 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 2 of the Official Action rejects claims 25, 26, 29, 30, 33, 34, 41, 42, 45, 46, 49, 50-52, 62, 80, 98, 152, 170, 179, 209 and 211 as obvious based on the combination of U.S. Patent No. 6,414,280 to Nishitani, U.S. Patent No. 6,060,697 to Morita and U.S. Patent No. 5,006,695 to Elliott. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some reason to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims. The present invention relates to a method of manufacturing a semiconductor device, the method comprising heating a substrate with a plurality of light pulses, where each light pulse has a cycle of one second or longer, and is formed by switching on and off a lamp light source. For the reasons provided below, Nishitani, Morita and Elliott, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

The Official Action asserts that "Nishitani shows ... heating a substrate ... with a light lamp source ... wherein the intensity of the light is changed due to the switching on and off of the light source, the light source in a first stage wherein the switch is turned on within a cycle of one second or shorter, the light source in a second stage wherein the switch is turned off after the desired heating temperature is achieved" (page 2, Paper No. 20070806). The Official Action concedes that "Nishitani does not show a plurality of light pulses wherein each light pulse has a cycle of one second or longer" (Id.). Also, the Official Action asserts that "Morita shows that it is known in the art to provide a semiconductor manufacturing device using lamps or resistors as heating sources that are turned on and off to control the current applied to the heating sources and to maintain the desired heating temperature" (Id.). That is, the Official Action concedes that Nishitani and Morita do not teach or suggest a plurality of light pulses.

Further, the Official Action asserts that "Elliott shows that it is well known in the art that a heating system is provided with a heating element wherein the heating element in a first stage has a plurality of pulse forms that turns the heating on and off in a high ratio, and as the heating element reaches the desired heating temperature in a second stage, the ratio of the one and off time is decreased" (Id.). The Applicant respectfully disagrees and traverses the assertions in the Official Action in that Nishitani, Morita and Elliott do not teach or suggest a plurality of light pulses.

The Official Action does not provide any specific references to Elliott which supports the assertion that Elliott teaches a plurality of pulse forms. In any event, Elliott

does not teach this feature. In Figure 1 of Elliott, an apparatus 20 has a heating mantle 22 for heating a substance 24. The apparatus 20 further has a solid state relay 56. The solid state relay 56 has an output which is connected via a line 62 to the mantle 22. A timing diagram of Figure 4 of Elliott illustrates an output of the solid state relay of Figure 1. A power supply 58, such as a 120 volt power source, is connected to the solid state relay 56 via a line 60. Waveform 116 represents the output of the solid state relay 56 over line 62. Even if the output of the solid state relay 56 represented by waveform 116 is pulsed, the solid state relay 56 does not emit a light. Therefore, Elliott also does not teach or suggest a plurality of light pulses.

Therefore, the Applicant respectfully submits that Nishitani, Morita and Elliott, either alone or in combination, do not teach or suggest a method of manufacturing a semiconductor device, the method comprising heating a substrate with a plurality of light pulses, where each light pulse has a cycle of one second or longer, and is formed by switching on and off a lamp light source.

Since Nishitani, Morita and Elliott do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraph 3 of the Official Action rejects claims 27, 28, 31, 32, 35-40, 43, 44, 47, 48, 53-56, 71, 89, 107, 116, 125, 134, 143, 161, 188, 197, 201-203, 205-208, 210 and 212 as obvious based on the combination of Nishitani, Morita, Elliott, U.S. Patent No. 6,461,439 to Granneman and U.S. Patent No. 6,399,921 to Johnsgard.

Please incorporate the arguments above with respect to the deficiencies in Nishitani, Morita and Elliott. Granneman and Johnsgard do not cure the deficiencies in Nishitani, Morita and Elliott. The Official Action relies on Granneman and Johnsgard to allegedly teach supplying a heated gas into a reaction tube (pages 3-4, Paper No. 20070806). However, Nishitani, Morita, Elliott and Granneman and Johnsgard, either alone or in combination, do not teach or suggest the following features or that Nishitani,

Morita and Elliott should be modified to include any of the following features: a method of manufacturing a semiconductor device, the method comprising heating a substrate with a plurality of light pulses, where each light pulse has a cycle of one second or longer, and is formed by switching on and off a lamp light source. Since Nishitani, Morita, Elliott and Granneman and Johnsgard do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

The Official Action appears to be incomplete. Although Box 6 of the Office Action Summary includes claim 204 in the list of rejected claims, claim 204 is not included in the rejections at pages 2-4 of the Official Action. As such, the Applicant respectfully requests issuance of a new non-final Official Action or Notice of Allowability, as appropriate. The Applicant respectfully submits that claim 204 is in condition for allowance.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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